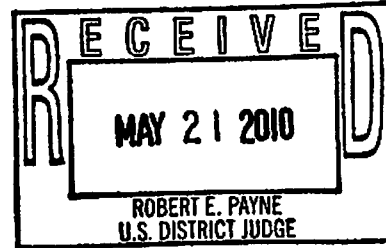


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May 21, 2010

The Honorable Robert E. Payne
United States District Court for the
Eastern District of Virginia
Federal Courthouse – Room 3000
701 East Broad Street
Richmond, VA 23219

3:05 p.m.

Re: ePlus, Inc. v. Lawson Software, Inc
Civil Action No. 3:09cv620

Dear Judge Payne:

At page 10 of ePlus's Reply Brief in Further Support of It's Motion to Strike, filed yesterday, ePlus argues that Lawson's prior art systems, as non-infringing alternatives, would be relevant only to lost profits, not the reasonable royalty damages ePlus seeks here. This is an incorrect statement of the law. In *Zygo Corp. v. Wyko Corp.*, 79 F.3d 1563 (Fed. Cir. 1996), the Court remanded the case for a re-determination of the damages award. The accused infringer had a non-infringing product, called SIRIS. The Court stated as follows:

Reasonable Royalty

In contrast the fact that Wyko could have continued marketing the SIRIS is a factor relevant to the determination of a proper royalty during hypothetical negotiations. Wyko would have been in a stronger position to negotiate for a lower royalty rate knowing it had a competitive non-infringing device "in the wings." On remand, the Court shall reconsider its award of a 25 percent royalty rate in light of Wyko's ability to market the non-infringing SIRIS in lieu of marketing the infringing Original Wyko 6000.

79 F.3d at 1571-72. See also *Riles v. Shell Exploration and Prod. Co.*, 298 F.3d 1302, 1212 (Fed. Cir. 2002) ("Thus, under the constraints of the hypothetical negotiation, the market could not award Riles a royalty for his method divorced of all relation to a

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The Honorable Robert E. Payne

May 21, 2010

Page 2

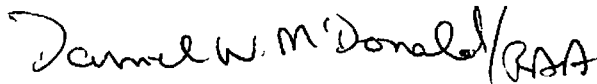
potentially non-infringing alternative method.”). These are but two examples of controlling case law that shows that non-infringing alternatives, including the accused infringer’s own non-infringing products, are highly relevant to the reasonable royalty analysis. These cases confirm the high level of relevance of Lawson’s prior systems to issues other than invalidity. Copies of the decisions are enclosed.

Also enclosed please find *DataQuill Ltd. v. Handspring, Inc.*, No. 01-4635, 2002 U.S. Dist. LEXIS 27659 (N.D. Ill. Dec. 19, 2003), which denies a motion to exclude the report of an invalidity expert which relies upon prior art not cited in contention interrogatory responses, and supports our position. The court states:

We do not agree with [plaintiff’s] contentions that [defendant’s] expert is bound solely to the contentions put forth in their interrogatory responses. However, even if he were, the failure to include them before this point is harmless. The time for expert discovery has not passed; [plaintiff] still has a full opportunity to inquire into Dr. Allen’s contentions and the basis for his opinions at his deposition. See *Transclean Corp. v. Bridgewood Servs., Inc.*, 77 F.Supp2d 1045, 1063-64 (D. Minn. 1999).

Sincerely,

MERCHANT & GOULD

A handwritten signature in black ink that reads "Daniel W. McDonald" followed by a stylized flourish or set of initials.

Daniel W. McDonald

DWM/vh

cc: Scott L. Robertson, Esquire



LEXSEE 79 F.3D 1563,AT 1571

**ZYGO CORPORATION, Plaintiff-Appellee, v. WYKO CORPORATION,
Defendant-Appellant.**

94-1445

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

79 F.3d 1563; 1996 U.S. App. LEXIS 5614; 38 U.S.P.Q.2D (BNA) 1281

March 26, 1996, DECIDED

SUBSEQUENT HISTORY: **[**1]** Rehearing Denied
May 15, 1996, Reported at: *1996 U.S. App. LEXIS 12587*.

PRIOR HISTORY: Appealed from: U.S. District
Court for the District of Arizona (Tucson). Judge
Quackenbush.

DISPOSITION: **AFFIRMED-IN-PART,
REVERSED-IN-PART, AND REMANDED**

COUNSEL: Lawrence G. Kurland, of New York, New
York, argued for plaintiff-appellee. With him on the brief
were Michael G. Biggers, Arthur Mann and Bryan Cave.

Donald R. Dunner, Finnegan, Henderson, Farabow,
Garrett & Dunner, of Washington, D.C., argued for
defendant-appellant. Joseph W. Mott, Terry E. Fenzl and
Patricia A. Hubbard, Brown & Bain, P.A., of Phoenix,
Arizona, were on the brief for defendant-appellant. Of
counsel was J. Michael Jakes, Finnegan, Henderson,
Farabow, Garrett & Dunner, of Washington, D.C.

JUDGES: Before LOURIE, Circuit Judge, NIES, *
Senior Circuit Judge, and BRYSON, Circuit Judge.

* Judge Nies assumed Senior status on
November 1, 1995.

OPINION BY: NIES

OPINION

[*1565] NIES, *Senior Circuit Judge*.

Wyko Corporation appeals the final judgment of the
United States District Court for the District of Arizona
(Civil Action No. CIV 88-454-T-JLQ), which held Zygo
Corporation's *United States Patent No. 4,201,473* ("the
'473 patent") for an interferometer system not invalid and
infringed by three models of Wyko interferometers,
resulting **[**2]** in an award of \$ 2,668,710.43 in damages
calculated in part as lost profits and in part as a
reasonable royalty. We hold that the district court clearly
erred in finding that one model, the Wyko 6000
Redesign, infringed under the doctrine of equivalents. We
affirm the finding of infringement on the Original Wyko
6000 designs.

In sum, for reasons discussed more fully below, we
affirm-in-part, reverse-in-part, and remand for
recalculation of damages.

I.

Background

Dissatisfied with existing interferometers, Zygo set
out to design and patent its own devices. In 1977, Zygo
designed the Zygo Mark II, the commercial embodiment
of the invention claimed in the '473 patent. The patented
interferometer has two modes of operation, alignment and

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viewing. In the alignment mode, the internal TV camera is focused down the "alignment leg." The reference and test wavefronts are collected by a series of optic elements and projected as two dots of light onto a stationary diffuse screen. Embedded into the stationary diffuse screen is a visible cross-hair reticle with a marked center indicating the optical axis. The image on the screen of the dots and reticle is picked up by a TV camera [**3] and displayed on a CCTV monitor. An operator moves the dots to the center of the alignment reticle at which point alignment is achieved.

To view the fringe pattern, the interferometer must be switched into the "view mode." When the view mode is entered, a flip mirror is moved and a TV camera is focused down the "view leg," which permits the combined wavefronts to be imaged as a fringe pattern onto a second diffuse screen. This diffuse screen is movable with respect to the path of the wavefronts so as to destroy the coherence length of the beam¹ and to eliminate spurious fringe patterns. The view leg includes a continuous zoom lens positioned between the camera and the movable diffuse screen. The diffuse screen, together with the fringe pattern caused by the interference of the reference and test wavefronts in the recombined beam, is imaged onto the camera.

1 "Coherence length" is defined as the maximum tolerable optical path length difference between two energy beams which are forming an interference pattern. Handbook of Chemistry and Physics, F-83 (Robert C. Weast, Ph.D. ed., 63rd ed. 1982-83).

[**4] The inventors constructed a "breadboard" of the patented interferometer during the course of their development work. The breadboard, which was built on a 2' by 2' plate, consisted of the various optical components disclosed in the '473 patent. In transforming the breadboard interferometer into a functioning commercial unit, Zygo made several necessary additions. For example, the entire device was encased in a metal box for protective purposes, and a spherical field lens, which functioned to make the alignment spots appear brighter on the television monitor, was built into the back of the stationary view screen. As a result of encasing the device, a mirror had to be added to illuminate [*1566] the view screen and improve visibility. The '473 patent does not disclose the enclosure, the spherical field lens, or the illumination mirror.

On April 21, 1978, Zygo filed the patent application which matured into the '473 patent. The claims were initially rejected under 35 U.S.C. § 103 as being obvious in view of a brochure describing a prior art interferometer, the Tropel reference. Zygo responded with argument that the claims as filed were patentably distinct over that prior art. In particular, [**5] Zygo noted that the Tropel reference failed to teach the use of zoom magnification, an alignment reticle, or means for destroying coherence length (i.e. the movable diffuse screen). The Examiner then allowed the claims, and the '473 patent issued on May 6, 1980.

The Accused Device

Defendant Wyko Corporation was founded in 1982 by Dr. Wyant, a professor at the University of Arizona, and Mr. Chris Koliapolis, a former doctoral candidate student of Dr. Wyant's. This litigation centers around two Wyko optical interferometer systems: the original Wyko 6000 and the Wyko 6000 Redesign. The original Wyko 6000 interferometer was first introduced in January 1988. The Wyko 6000 Redesign made its debut about one year after initiation of this lawsuit.

The original Wyko 6000 included a stationary diffuse screen onto which the reference and test wavefronts were focused as dots of light which were imaged onto a television camera, converted into electronic data, and appeared on a computer monitor along with a reticle for alignment that was generated by computer software. The two dots were tilted and tipped until they overlapped at the center of the cross-hair which meant they were aligned [**6] along the optical axis of the interferometer.

In the Wyko 6000 Redesign, no reticle is displayed for alignment. Instead, a prism is used which is factory-positioned so that its axis is parallel to the optical axis of the interferometer. When so positioned, the prism deflects light that is not parallel to its axis. If the wavefronts are not in alignment, the prism creates a split-image of the test and reference wavefronts such that four dots (two for each wavefront) are projected onto the diffuse screen. This image is transferred to a TV monitor. Both pairs of dots are moved together. When properly aligned, the four dots coalesce into a single spot, which means they are aligned along the optical axis of the interferometer.

In the view mode, both the original and redesigned

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Wyko 6000 systems included a rotating ground glass screen positioned in front of a continuous zoom lens. Similar in purpose to the movable screen in the Zygo interferometer, the rotating ground glass screen functioned to eliminate spurious fringe patterns. There is no dispute that the Wyko devices meet the limitations respecting the view mode.

Procedural History

The court entered its Findings of Fact [**7] and Conclusions of Law on March 3, 1993, holding the '473 patent was neither invalid (1) for lack of an enabling disclosure or (2) for failing to disclose the best mode, nor was the patent unenforceable for inequitable conduct before the Patent Office. While none of the accused Wyko devices were found to literally infringe the '473 patent, the court concluded that all versions of the accused Wyko devices infringed under the doctrine of equivalents.

The damages phase of the trial was similarly tried to the bench, after which the court entered its Findings of Fact and Conclusions of Law and awarded Zygo over \$ 2.1 million in total lost profits and a reasonable royalty. The court also awarded prejudgment interest in the amount of \$ 532,755.04.

On appeal, Wyko alleges the district court erred in the finding that the accused devices infringed the '473 patent under the doctrine of equivalents, and in concluding that the '473 patent was not invalid for failure to disclose the best mode. Wyko also challenges the award of damages calculated as lost profits.

II.

Best Mode

Compliance with the best mode requirement [*1567] of 35 U.S.C. § 112 P 12² is a question of fact. *Scripps Clinic & [**8] Research Found. v. Genentech, Inc.*, 927 F.2d 1565, 1578, 18 U.S.P.Q.2D (BNA) 1001, 1012 (Fed. Cir. 1991). In this case, which was tried to the bench, the court's finding that there was no violation of section 112 is reviewed under the clearly erroneous standard. *Spectra-Physics, Inc. v. Coherent, Inc.*, 827 F.2d 1524, 1535-36, 3 U.S.P.Q.2D (BNA) 1737, 1745 (Fed. Cir.), cert. denied, 484 U.S. 954, 98 L. Ed. 2d 372, 108 S. Ct. 346 (1987).

2 Section 112 reads in pertinent part:

The specification . . . shall set forth the best mode contemplated by the inventor for carrying out his invention.

Prior to filing the patent application, the inventors made an optical breadboard embodiment of the invention. Also prior to filing, Zygo made a commercial embodiment which encased the interferometer in a box. To make the encased interferometer work, it was necessary to add an illumination mirror and a spherical field lens. Only the interferometer, that is, without any enclosure together with the add-ons thereby made necessary, is disclosed and claimed.

[**9] Wyko argues that the encased interferometer--the commercial embodiment--was the best mode contemplated by the inventors for carrying out their invention. Zygo argues that the court properly concluded that the best mode requirement of section 112 P 1 was met here because the claimed invention is not an encased interferometer and that section 112 does not mandate disclosure of activities done in furtherance of commercialization of the claimed invention.

The phrases "best mode" and "carrying out the invention" are not statutorily defined. What is a "mode" of the "invention"? What acts or ideas are meant to be encompassed by the phrase "carrying out the invention"? These questions are not answered by a mechanical rule. See *Wahl Instruments, Inc. v. Acvious, Inc.*, 950 F.2d 1575, 1579, 21 U.S.P.Q.2D (BNA) 1123, 1126 (Fed. Cir. 1991) ("The words in the statute are not without ambiguity. This case illustrates that the term 'mode' and the phrase 'carrying out the invention' are not definable with precision.").

Wyko's best mode defense amounts to an attack on the nondisclosure of a particular embodiment, a commercial mode for a particular type of use of the claimed invention. At least one of the [**10] inventors contributed to the commercial design. The failure to disclose the commercial mode, however, does not *ipso facto* result in a section 112 violation. The focus of a section 112 inquiry is not what a particular user decides to make and sell or even in what field the invention is most likely to find success. Rather, in keeping with the statutory mandate, our precedent is clear that the

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parameters of a *section 112* inquiry are set by the claims. *Engel Indus., Inc. v. Lockformer Co.*, 946 F.2d 1528, 1531, 20 U.S.P.Q.2D (BNA) 1300, 1302 (Fed. Cir. 1991) ("The best mode inquiry is directed to what the applicant regards as his invention, which in turn is measured by the claims."); *Chemcast Corp. v. Arco Indus. Corp.*, 913 F.2d 923, 927, 16 U.S.P.Q.2D (BNA) 1033, 1036 (Fed. Cir. 1990) ("The other objective limitation on the extent of the disclosure required to comply with the best mode requirement is, of course, the scope of the claimed invention.").

Here, the claimed invention is an interferometer system which has a number of applications. The inventors disclosed the mode for carrying out that claimed invention: a light source, beamsplitters, various optical elements, a diffuse screen with [*11] a reticle, a camera, and a monitor arranged in a particular manner. It is undisputed by the parties that the disclosure is adequate to enable one of skill in this art to practice the invention of the claims. *Chemcast*, 913 F.2d at 928, 16 U.S.P.Q.2D (BNA) at 1036-37. It is also undisputed and the record indicates that interferometers can function and are used commercially without an enclosure. The only argument is that the hardware added to make Zygo's enclosed commercial embodiment should have also been disclosed. That argument must be rejected. Because the claims simply do not require packaging of any sort, the failure to disclose the enclosure is not a violation of *section 112*. *Engel Indus.*, 946 F.2d at 1531 ("Unclaimed subject matter is not subject to [*1568] the disclosure requirements of § 112."); *Christianson v. Colt Indus. Operating Corp.*, 822 F.2d 1544, 1563, 3 U.S.P.Q.2D (BNA) 1241, 1255 (Fed. Cir. 1987) (since "inter-changeability with M-16 parts appears nowhere as a limitation in any claim . . . the best mode for making and using and carrying out the claimed inventions does not entail or involve" interchangeability), *vacated on other grounds*, 486 U.S. 800 (1988) (emphasis [*12] in original).

With respect to the subject matter of the claims, an enclosed mode may or may not be "best" for a particular commercialization. But it is clear that an enclosure is not a necessary part of this invention and there is no evidence that either inventor considered an enclosed interferometer to be the best mode of carrying out the invention. *Cf. Dana Corp. v. IPC Ltd. Partnership*, 860 F.2d 415, 8 U.S.P.Q.2D (BNA) 1692 (Fed. Cir. 1988) (best mode violated when inventor failed to disclose use of specific

surface treatment that he knew to be necessary for satisfactory performance), *cert. denied*, 490 U.S. 1067, 104 L. Ed. 2d 633, 109 S. Ct. 2068 (1989).

Under all of the circumstances of this case, the trial court's finding that Wyko failed to establish a violation of the best mode requirement of *section 112* P 1 is not clearly erroneous. Accordingly, the court's conclusion of law that the '473 patent is not invalid is affirmed.

III.

Infringement Under the Doctrine of Equivalents

The infringement dispute in this case centers on the claim language "means for collecting said two wavefronts and focusing them as spots onto a diffuse screen containing an integral alignment reticle having a marked center." The [*13] court construed the emphasized language to mean the alignment reticle and the diffuse screen were "one piece." Literal infringement is not an issue. No Wyko device contains a unitary screen and an alignment reticle as required by the claim. The only issue is infringement under the doctrine of equivalents. We affirm the finding of infringement by the original Wyko 6000 models but reverse with respect the Wyko 6000 Redesign.

Infringement under the doctrine of equivalents may be found where those limitations of a claim not found exactly in the accused device are met equivalently. In *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 935, 4 U.S.P.Q.2D (BNA) 1737, 1739-40 (Fed. Cir. 1987) (*in banc*), *cert. denied*, 485 U.S. 961, 485 U.S. 1009, 99 L. Ed. 2d 426, 108 S. Ct. 1226 (1988), the *in banc* court held:

It is well settled that each element of a claim is material and essential, and that in order for a court to find infringement, the plaintiff must show the presence of every element or its substantial equivalent in the accused device. *Lemelson v. United States*, 752 F.2d 1538, 1551, 224 U.S.P.Q. (BNA) 526, 533 (Fed. Cir. 1985).

See Athletic Alternatives, Inc. v. Prince Mfg., Inc., 73 F.3d 1573, 1581, 37 U.S.P.Q.2D [*14] 1365, 1373 (Fed. Cir. 1996) ("Liability for infringement thus requires, without exception, that an accused product contain each limitation or its equivalent."); *Laitram Corp.*

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v. Rexnord, Inc., 939 F.2d 1533, 1539, 19 U.S.P.Q.2D (BNA) 1367, 1369 (Fed. Cir. 1991) ("The failure to meet a single limitation is sufficient to negate infringement of the claim."); see also *Dolly, Inc. v. Spalding & Evenflo Co.*, 16 F.3d 394, 397, 29 U.S.P.Q.2D (BNA) 1767, 1769 (Fed. Cir. 1994). Infringement may not be found under the doctrine of equivalents if a limitation is missing, that is, not replaced with an equivalent substituent. But as explained in *Corning Glass Works v. Sumitomo Electric U.S.A., Inc.*, 868 F.2d 1251, 9 U.S.P.Q.2D (BNA) 1962 (Fed. Cir. 1989), the substituent need not be in the exact same location specified by the claim. If, in the context of the invention, the substituent substantially performs the same function to achieve the same result in the same way as the required limitation, that limitation is satisfied.

A.

In the original Wyko 6000 devices, a reticle which coincided with the location of the optical axis, in the words of the claim, an "alignment reticle," was generated by hardware [*1569] or software [**15] and appeared on a monitor together with the two dots imaged by the camera from the diffuse screen.³ Thus, the image on the Wyko monitor duplicated the required image on the monitor in the alignment mode of the invention. We have no difficulty agreeing that the image of the reticle generated on the monitor is the equivalent of the physical reticle on the screen which is also imaged on the monitor in the Zygo invention. While the alignment reticle has been moved within the alignment leg of the accused interferometers, the function of alignment is accomplished in the same way, by moving the two spots to coalesce at the center of a reticle which coincides with the optical axis of the interferometer. Similarly, the point at which the crosshairs cross is at least equivalent to a marked spot.

3 In the first four original units, the alignment crosshair was displayed on the computer monitor only. In the 14 modified original units, the reticle also was generated on the TV monitor.

In sum, the evidence supports the [**16] trial court's finding of equivalency between the alignment reticles of the accused and patented devices both of which are the means for alignment. Inasmuch as all other elements of the claims are admittedly met in Wyko's original devices, this ultimate finding of infringement is not clearly erroneous.

B.

Turning to the Wyko 6000 Redesign, we reach the opposite conclusion. In these devices, an image inverting prism is placed in the path of the wavefronts that emerge from the diffuse screen. Each portion of the wavefronts that passes around the prism is projected as a spot on the camera. Each part of the wavefront passing through the prism is deflected and projected as a separate spot on the camera. The spots are mirror images. When these four spots coincide, the positions of which can be adjusted by the operator, alignment is achieved. In the Redesign, there is no substitute "alignment reticle," that is, crosshairs defining the optical axis of the interferometer. The "alignment aid" is the prism structure which splits each of the beams on its way to the camera into two so that four dots appear on the monitor. These four dots are moved so as to coalesce into one, at which point [**17] the beams are centered on the axis of the interferometer. Thus, to find infringement, the prism structure must be found an equivalent of an alignment reticle placed on the optical axis, a finding which is not supportable. That both can be labelled "alignment aids," as Zygo terms them, does not answer the question whether they are equivalent within the concept of infringement. That the substituent performs the same general function to achieve the same result as the required element also does not establish their equivalency. The result must be achieved in substantially the same way. *Dolly*, 16 F.3d at 400, 29 U.S.P.Q.2D (BNA) at 1771 ("An 'equivalent' of a claim limitation cannot substantially alter the manner of performing the claimed function.").

Here, there is simply no dispute that the alignment aids in the two devices are not only structurally different but also operate in a different way. Making four beams coalesce without a reticle for centering on the optical axis is obviously not the same principle of operation as making two beams coalesce at the center of an alignment reticle. A finding of equivalency just because the same result is achieved is "a flagrant abuse of the term 'equivalent'." [**18] *Burr v. Duryee*, 68 U.S. (1 Wall.) 531, 573, 17 L. Ed. 650 (1863).

One complicating factor here is that a software generated reticle can be made to appear on the computer monitor of the Wyko Redesign and the four alignment spots happen to coalesce very near the center of that reticle. Zygo asserts that because of this reticle in the Wyko Redesign, these devices also meet the limitations

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of "an alignment reticle integral with the screen." Wyko counters that the reticle on the computer monitor is not positioned exactly on the optical axis and, therefore, unlike in the original Wyko 6000, this reticle cannot serve as a meaningful reference. The record establishes that the software in the original was replaced in the Redesign. The new software creates a reticle which is used only to assist factory setup of the view mode intensity display. It serves no purpose on the computer [*1570] monitor in the alignment mode, and the computer must be misadjusted for it even to be seen.

Zygo argues that under the precedent of *Intel Corp. v. United States Int'l Trade Comm'n*, 946 F.2d 821, 832, 20 U.S.P.Q.2D (BNA) 1161, 1171 (Fed. Cir. 1991), a device which is capable of infringing use does not escape infringement although [*19] not actually used in an infringing manner. However, Zygo overreads *Intel*. By its literal terms, the claim involved in *Intel* only required "capability" (i.e., "programmable selection means"). The substitute means in the accused device in *Intel* literally met the claim language.

In any event, the alignment aid in the Wyko Redesign is the prism, not an alignment reticle, i.e., one placed on the center of alignment. The reticle in the Redesign is not positioned as an "alignment reticle," does not function as one, and is present in the device for an entirely different purpose. Further, using spots through and around the prism is a distinctly different "way" of achieving alignment from imaging spots directly from the diffuse screen to a monitor for alignment on a displayed reticle. Because the Redesign operates on different optical principles, the same "way" prong of the tripartite test has not been satisfied.⁴

4 We note that the trial court's original opinion contained language in agreement with our disposition:

The Wyko Redesign utilizes a different way, that is, a prism, to create a split image alignment aid focused onto a diffuse screen, with no alignment aid physically appearing on the television monitor, which is a different way of indicating the spot where the optical axis is.

However, the court issued an Amended Opinion from which this language was stricken and replaced with a contrary conclusion.

[**20] Finally, for purposes of infringement under the doctrine of equivalents, the differences between the claimed device and the accused device must be insubstantial. *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 610, 94 L. Ed. 1097, 70 S. Ct. 854 (1950); *Singer Mfg. Co. v. Cramer*, 192 U.S. 265, 286, 48 L. Ed. 437, 24 S. Ct. 291 (1904); *Hilton Davis Chem. Co. v. Warner-Jenkinson Co.*, 62 F.3d 1512, 1518, 35 U.S.P.Q.2D (BNA) 1641, 1645 (Fed. Cir. 1995) (in banc), cert. granted, 134 L. Ed. 2d 95, 1995 WL 668878 (U.S. 1996) ("The application of the doctrine of equivalents rests on the substantiality of the differences between the claimed and accused products or processes, assessed according to an objective standard."). According to Wyko, the fact that the Wyko 6000 Redesign alignment system was patented demonstrates the substantiality of the differences between the claimed and accused devices.

Wyko's patent, against which the '473 patent was cited and considered as prior art, is thus presumed nonobvious in view of the '473 patent until proven otherwise. The nonobviousness of the accused device, evidenced by the grant of a United States patent, is relevant to the issue of whether the change therein is substantial. *Roton Barrier, Inc.* [*21] v. *Stanley Works*, 79 F.3d 1112, 1996 U.S. App. LEXIS 5380, 1996 WL 92068, 37 U.S.P.Q.2D 1816 (Fed. Cir. 1996) (Nies, J., Additional Views); *National Presto Indus., Inc. v. West Bend Co.*, 76 F.3d 1185, 1192, 37 U.S.P.Q.2D (BNA) 1685, 1689 (Fed. Cir. 1996) ("The fact of separate patentability is relevant, and is entitled to due weight.").

In sum, the accused interferometer with the prism alignment system simply can not be deemed an insubstantial change from Zygo's claimed interferometer with the reticle alignment system. *Hilton Davis*, 62 F.3d at 1518, 35 U.S.P.Q.2D (BNA) at 1645. Because the Redesign has no reticle for alignment or equivalent thereof, a limitation required by the claim is missing and there is no infringement. *Pennwalt*, 833 F.2d at 935, 4 U.S.P.Q.2D (BNA) at 1739-40; *Athletic Alternatives*, 73 F.3d at 1581, 37 U.S.P.Q.2D (BNA) at 1373.

IV.

Damages

79 F.3d 1563, *1570; 1996 U.S. App. LEXIS 5614, **21;
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In view of the reversal of the finding that the Wyko 6000 Redesign infringed the '473 *patent*, the damages award is vacated. The trial court's analysis did not distinguish between the Original and the Redesign Wyko models in addressing the issues of lost profits, conveyed sales, and reasonable royalty, and it is unclear that the court's findings are applicable to the Original [**22] Wyko alone. Under [*1571] these circumstances, we remand with instructions to recalculate the damages due Zygo for the infringement by the Original Wyko models.

Lost Profits

The central damages issue on appeal is whether the court erred in concluding that Wyko's SIRIS interferometer was not an acceptable noninfringing alternative to the Zygo interferometers. The record indicates that Wyko stopped marketing the SIRIS interferometer when it began marketing the Wyko 6000 interferometer. Wyko argues that the award of lost profits was error on the theory that they would have continued making and selling the SIRIS had they not made and sold the Wyko 6000 interferometers.

It is axiomatic, however, that if a device is not available for purchase, a defendant cannot argue that the device is an acceptable noninfringing alternative for the purposes of avoiding a lost profits award. A lost profits award reflects the realities of sales actually lost, not the possibilities of a hypothetical market which the infringer might have created. Thus, whether or not the SIRIS was an acceptable noninfringing alternative is relevant only for the period of time that the SIRIS interferometer was being [**23] marketed by Wyko.

The court's finding that the SIRIS interferometer was not an acceptable noninfringing alternative is reviewed for clear error. See *Minnesota Mining and Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1577, 24 U.S.P.Q.2D (BNA) 1321, 1337 (Fed. Cir. 1992) ("The existence of a noninfringing substitute is a question of fact, reviewable under the clearly erroneous standard."); *SmithKline Diagnostics v. Helena Lab. Corp.*, 926 F.2d 1161, 1163-65, 17 U.S.P.Q.2D (BNA) 1922, 1924-27 (Fed. Cir. 1991) (discussing standard of review). We must question the court's finding that the SIRIS interferometer was not an acceptable alternative, however, because of the insufficiency of the court's findings. Zygo bore the burden of proof and the record evidence, while sparse, suggests a contrary conclusion, at least as to the Mark IV interferometer.

The SIRIS interferometer with the FIZ4 adapter, like the Wyko 6000 and the Mark IV interferometers, was a phase-shifting Fizeau type interferometer. The software that was used in the Wyko 6000 was "basically the same package" as used in the SIRIS interferometer and the SIRIS was "repackaged" and renamed the 6000. Furthermore, there was [**24] ample testimony regarding the capabilities of the SIRIS interferometer with the FIZ4 adapter, the advantages of the SIRIS and the disadvantages of the Mark IV interferometer. For example, whereas the SIRIS used a "powerful Hewlett-Packard computer," the Mark IV had a Zygo-built computer that lacked an internal hard drive, was "very slow" and had "very poor computer graphics." There was also testimony that the SIRIS and Mark IV interferometers could test the same components, served the same applications, and that there was nothing the Mark IV could do that the SIRIS with the FIZ4 adapter could not.

While we do not, on this record, have a definite and firm conviction that a mistake has been made warranting reversal on this issue, *United States v. United States Gypsum Co.*, 333 U.S. 364, 395, 92 L. Ed. 746, 68 S. Ct. 525 (1948), we, nevertheless, vacate the award and remand with instructions for the court to provide findings in support of its conclusion that the SIRIS was not an acceptable noninfringing ⁵ alternative (assuming its actual availability during some of the period the Original Wyko models were on the market). The court's findings should include details regarding the similarities and differences between [**25] the SIRIS, Mark IV, and Mark IVxp interferometers.

5 That the SIRIS was noninfringing was not, as noted by the court, in dispute below, nor does Zygo assert the SIRIS infringed the '473 *patent* on appeal.

Reasonable Royalty

In contrast, the fact that Wyko could have continued marketing the SIRIS is a factor relevant to the determination of a proper royalty during hypothetical negotiations. Wyko would have been in a stronger position to negotiate for a lower royalty rate knowing it had a competitive noninfringing [*1572] device "in the wings." On remand, the court shall reconsider its award of a 25% royalty rate in light of Wyko's ability to market the noninfringing SIRIS in lieu of marketing the infringing Original Wyko 6000.

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V.

Conclusion

The court's conclusion that the '473 *patent* is not invalid for failure to set forth the best mode is affirmed, as is the finding that the original Wyko 6000 infringed claim 1 of the '473 *patent* under the doctrine of equivalents. The court's finding that the [**26] Wyko 6000 Redesign infringed claim 1 under the doctrine of

equivalents is reversed. The case is remanded to the district court for a redetermination of the damage award consistent with this opinion.

Costs

Each party shall bear its own costs.

AFFIRMED-IN-PART, REVERSED-IN-PART,
AND REMANDED



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WILLIAM G. RILES, Plaintiff-Cross Appellant, v. SHELL EXPLORATION AND PRODUCTION COMPANY, Defendant-Appellant.

01-1553, 01-1569

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

298 F.3d 1302; 2002 U.S. App. LEXIS 15342; 63 U.S.P.Q.2D (BNA) 1819

July 31, 2002, Decided

SUBSEQUENT HISTORY: **[**1]** Rehearing Denied September 25, 2002, Reported at: *2002 U.S. App. LEXIS 21337*. Rehearing En Banc Denied September 25, 2002, Reported at: *2002 U.S. App. LEXIS 21340*.

PRIOR HISTORY: Appealed from: United States District Court for the Southern District of Texas. Judge Sim Lake.

DISPOSITION: **AFFIRMED-IN-PART, VACATED-IN-PART, and REMANDED.**

COUNSEL: Jonathan T. Suder, Friedman, Young, Suder & Cooke, of Fort Worth, Texas, argued for plaintiff-cross appellant. With him on the brief was Michael T. Cooke. Of counsel on the brief was John C. Janka, Niro, Scavone, Haller & Niro, of Chicago, Illinois.

Willem G. Schuurman, Vinson & Elkins L.L.P., of Austin, Texas, argued for defendant-appellant. With him on the brief were David P. Blanke, Gwen Samora and Adam V. Floyd. Of counsel on the brief were Albert M.T. Finch and Eugene Montalvo, Shell Oil Company, of Houston, Texas; and Richard L. Stanley, Howrey Simon Arnold & White, of Houston, Texas.

JUDGES: Before MICHEL, RADER, and GAJARSA, Circuit Judges. Opinion for the court filed by Circuit Judge RADER. Dissenting opinion filed by Circuit Judge MICHEL.

OPINION BY: RADER

OPINION

[*1305] RADER, Circuit Judge.

The United States District Court for the Southern District of Texas refused to overturn as a matter of law a jury verdict of infringement and award of damages. *William G. Riles v. Shell Exploration & Prod. Co.*, 2001 U.S. Dist. LEXIS 24373, H-00-0304 (S.D.Tex. June 19, 2001). **[**2]** Shell Exploration and Production Co. appeals that decision. William G. Riles cross appeals because the district court vacated the jury's finding of literal infringement and also denied enhanced damages. Because substantial evidence supports the jury's finding of infringement, this court affirms. Because the damage award is excessive and unsupported by evidence, this court vacates and remands. Because the district court did not abuse its discretion, this court affirms the denial of enhanced damages.

I.

On August 27, 1999, William G. Riles (Riles) filed suit against Shell Exploration and Production Co. (Shell) for infringement of his *U.S. Patent No. 4,669,918 (the '918 patent)*. The '918 patent relates to construction and installation of fixed offshore platforms for oil drilling.

A fixed offshore platform comprises a jacket and a

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deck. Before Riles's invention, fixed offshore platforms were installed in the following sequence. The first step placed the jacket on the sea floor. Typically, a mud mat temporarily leveled and supported the jacket on the sea floor. Mud mats are large, flat steel frames attached to the base of the jacket. After landing the jacket on the sea floor and [*1306] leveling [**3] it with the mud mats, foundation pilings were driven through the main legs of the jacket and into the sea floor to anchor the jacket. When the foundation pilings were connected to the jacket, the deck could be installed on top of the jacket.

Riles's '918 invention modifies the prior art installation sequence for fixed offshore platforms to allow installation without mud mats. The '918 *patent* first installs a foundation by pre-installing some or all of the pilings. Next, it sets the jacket or a portion of a jacket onto the pilings. Third, it installs additional pilings, if any. Fourth, it installs any remaining portions of the jacket with the deck on top of the jacket.

Only three limitations in the third step of claim 1 are at issue. Claim 1 reads:

1. The method of offshore platform installation, the platform including a plurality of pilings for respectively being driven at chosen sites in the mudline, which comprises the steps of

locating the site for each of the pilings at the mudline,

installing the pilings by driving them into the earth beneath the mudline so that each of said pilings extends only a short distance above the mudline, and

installing a space-frame [**4] jacket having depending support legs onto said pilings using stabbing connections for transferring the compressive load of the platform by effecting metal-to-metal bearing contact between said legs of the jacket and the top of the pilings.

(Emphasis added.)

Fig. 7 is a partial view of a jacket leg, spacer, and male extension in the '918 *patent*. This figure illustrates the stabbing function:

GET DRAWING SHEET 3 OF 5.

The top 54 of a piling is open to receive a male extension 56 located on the lower end of jacket 14. The lower end of the male extension may include a hard rubber wiper ring 58 for sealing the annular space between the external surface of the male leg extension and the external surface of the top of the piling. After the male extension extends into the bottom of jacket leg 60, it can be permanently attached by welding. The extension can also have a spacer 62 located at a position just below the jacket leg.

Shell's accused method installed four temporary "leveling pilings" into the ocean floor at predetermined locations. Meantime, during its fabrication of the Spirit platform on shore, Shell placed a [**5] "leveling porch" within the jacket structure at each corner. Each leveling porch consisted of a flat, circular metal plate, a reinforcing strut above the metal plate, and a layer of wooden timbers below the metal plate. The jacket also included two "guide [*1307] sleeves" below two leveling porches. Shell then lowered the jacket onto the temporary pilings, until the timber layers of the leveling porches came to rest on top of the pilings. Thereafter, within a few days, Shell inserted skirt foundation pilings in the conventional way through skirt sleeves at the four bottom corners of the jacket.

The following figure shows the jacket leg with a leveling porch, guide sleeve, and leveling piling for Shell's Spirit platform:

[SEE ILLUSTRATION IN ORIGINAL]

Before trial, the district court held a Markman hearing. In its September 7, 2000, order, the court adopted its earlier claim construction in *Riles v. Amerada Hess Corp.*, 1999 U.S. Dist. LEXIS 23194, Civil No. G-98-013. Thus, the district court defined the three limitations at issue:

"depending support leg" means "the lower portion of a space frame jacket leg which is angled to permit a stabbing connection to be made with a piling for support of [**6] the platform system;"

"stabbing connection" means "an end-to-end joining of two metal tubes by the insertion of an extension attached to

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the end of one of the tubes into the end of the other;"

"metal-to-metal bearing contact" means "a weight bearing contact between two metal surfaces."

Neither party contested the court's claim construction.

After trial, the jury returned a verdict that Shell, in installing the Spirit platform, infringed the '918 patent both literally and under the doctrine of equivalents. The jury also found that Shell's infringement was willful, and awarded Riles \$ 8.7 million in damages.

On Shell's motion for a judgment as a matter of law (JMOL) and in the alternative, for a new trial, the district court held that the record does not support the jury's finding that Shell's process met the "stabbing connection" and "metal-to-metal bearing contact" limitations literally. On the other hand, the trial court determined that the record supports the jury's finding that Shell's process met all three limitations under the doctrine of equivalents. Finally, the trial court held that the record supports Riles's entitlement to attorney fees, but [**7] not enhanced damages.

Shell appeals the district court's decision to uphold the jury's finding that its process met the "stabbing connection" and "metal-to-metal bearing contact" limitations under the doctrine of equivalents. Shell also contests the jury's finding that its process met the "depending supporting leg" limitation both literally and under the doctrine of equivalents. Finally, Shell's appeal also questions the amount of the jury's damage award.

Riles cross-appeals the district court's vacation of the jury's finding that Shell's process met the "stabbing connection" and "metal-to-metal bearing contact" limitations literally. Further Riles challenges the trial court's denial of enhanced damages. [*1308] This court has jurisdiction pursuant to 28 U.S.C. § 1295(a)(1) (1994).

II.

This court reviews a denial of JMOL by reapplying the JMOL standard. *SIBIA Neurosciences, Inc. v. Cadus Pharm. Corp.*, 225 F.3d 1349, 1354, 55 U.S.P.Q.2D (BNA) 1927, 1930 (Fed. Cir. 2000); *Fed. R. Civ. P. 50(a)(1)* (JMOL is appropriate when "a party has been

fully heard on an issue and there is no legally sufficient evidentiary basis for a reasonable jury to find for that party [**8] on that issue."). Thus, this court examines a JMOL decision to discern if it contains a legal error or if the record does not contain substantial evidence to support the jury's factual findings. *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454, 46 U.S.P.Q.2D (BNA) 1169, 1172 (Fed. Cir. 1998) (en banc). With regard to factual findings, this court draws all reasonable inferences in favor of the prevailing party, and does not substitute this court's view of the conflicting evidence for that of the jury. *SIBIA Neurosciences, Inc.*, 225 F.3d at 1355.

"The assessment of damages is a question of fact, and is decided by the jury when tried to a jury." *Festo Corp. v. Shoketsu Kogyo Kabushiki Co.*, 72 F.3d 857, 866, 37 U.S.P.Q.2D (BNA) 1161, 1167 (Fed. Cir. 1995), vacated on other grounds, 520 U.S. 1111 (1997). This court reviews a jury's damages award for substantial evidence. *Crystal Semiconductor Corp. v. Tritech Microelectronics Int'l, Inc.*, 246 F.3d 1336, 1346, 57 U.S.P.Q.2D (BNA) 1953, 1957 (Fed. Cir. 2001). This court reviews the district court's enhanced damages decision for "an erroneous conclusion of law, clearly erroneous [**9] factual findings, or a clear error of judgment amounting to an abuse of discretion." *Rite-Hite Corp. v. Kelley Co.*, 56 F.3d 1538, 1543-44, 35 U.S.P.Q.2D (BNA) 1065, 1067 (Fed. Cir. 1995) (en banc).

A.

"To prove literal infringement, the patentee must show that the accused device contains every limitation in the asserted claims. If even one limitation is missing or not met as claimed, there is no literal infringement." *Mas-Hamilton Group v. LaGard, Inc.*, 156 F.3d 1206, 1211, 48 U.S.P.Q.2D (BNA) 1010, 1014-15 (Fed. Cir. 1998) (citations omitted). "Judgment as a matter of law of no literal infringement is appropriate if no reasonable fact finder could determine that the accused devices meet every limitation of the properly construed claims." *Elkay Mfg. v. EBCO Mfg.*, 192 F.3d 973, 980, 52 U.S.P.Q.2D (BNA) 1109, 1114 (Fed. Cir. 1999). In this case, the district court found legally insufficient evidence to support the jury's finding that Shell's process met the "stabbing connection" and "metal-to-metal bearing contact" limitations literally. Indeed the record on review supports that decision.

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"Stabbing Connection"

The district court construed "stabbing connection" [**10] to mean "an end-to-end joining of two metal tubes by the insertion of an extension attached to the end of one of the tubes into the end of the other." Riles claims that Shell's Spirit platform's "leveling porch" meets the definition of "depending support leg." Further, Riles contends that the "guide sleeve" works in unison with the leveling porch to bring about a stabbing connection with the leveling piling. Neither the leveling porch nor the leveling piling have an extension. Moreover, the Shell process does not insert the leveling porch into the leveling piling, or vice versa. The Shell process simply guides the leveling piling through the guide sleeve to rest on the leveling porch. Thus, the district court did not err in finding that the record does not support the jury's finding that Shell's process met [*1309] the "stabbing connection" limitation literally.

"Metal-to-Metal Bearing Contact"

The district court construed "metal-to-metal bearing contact" to mean "a weight bearing contact between two metal surfaces." In the Spirit platform, each leveling porch consists of a flat circular metal plate, a reinforcing strut above the metal plate, and a layer of wooden timbers below the metal [**11] plate. The Shell process guides the leveling piling through the sleeve to rest on the layer of wooden timbers, rather than directly on the metal plate of the leveling porch. The district court did not err in finding that the record does not support the jury's finding that Shell's process met the "metal-to-metal bearing contact" limitation literally.

"Depending Support Leg"

The district court construed "depending support leg" to mean "the lower portion of a space frame jacket leg which is angled to permit a stabbing connection to be made with a piling for support of the platform system." Based on this construction, the jury found that Shell's process for installing the Spirit platform met this limitation both literally and under the doctrine of equivalents.

Substantial evidence supports the jury's finding of literal infringement. The "leveling porch" in the Spirit platform meets the definition of "depending support leg" because it is "the lower portion of a space frame jacket leg which is angled," and when working in unison with

the guide sleeve, "permits a stabbing connection to be made with a piling for support of the platform system." Contrary to Shell's assertion, the claim [**12] does not require the "depending support leg" to be the stabbing part of the connection, but only requires it to permit a stabbing connection.

B.

Infringement under the doctrine of equivalents requires that the accused product contain each limitation of the claim or its equivalent. *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 40, 41 U.S.P.Q.2D (BNA) 1865, 1875, 137 L. Ed. 2d 146, 117 S. Ct. 1040 (1997). "A claim element is equivalently present in an accused device if only 'insubstantial differences' distinguish the missing claim element from the corresponding aspects of the accused device." *Sage Prods., Inc. v. Devon Indus., Inc.*, 126 F.3d 1420, 1423, 44 U.S.P.Q.2D (BNA) 1103, 1106 (Fed. Cir. 1997). "Whether a component in the accused subject matter performs substantially the same function as the claimed limitation in substantially the same way to achieve substantially the same result may be relevant to this determination." *Ethicon Endo-Surgery, Inc. v. United States Surgical Corp.*, 149 F.3d 1309, 1315, 47 U.S.P.Q.2D (BNA) 1272, 1276 (Fed. Cir. 1998). Here, the district court found sufficient evidence to support the jury's finding of infringement [**13] under the doctrine of equivalents of all three limitations at issue.

"Stabbing Connection"

Substantial evidence supports the jury's finding that Shell's installation of the Spirit platform met the "stabbing connection" limitation under the doctrine of equivalents. At the outset, the '918 invention claims more than the preferred embodiment disclosed in the specification. The preferred embodiment uses the male extension of the jacket leg as the stabbing part of the connection. See Fig. 7 of the '918 patent supra. To emphasize that its claims encompass more than the preferred embodiment, the '918 specification teaches that "the piling may slip into a sleeve of the jacket, in which case there is still a [*1310] 'stabbing connection,' the piling acting to stab the jacket." Col. 4, ll. 17-21.

In installing the Spirit platform, Shell's leveling piling passes through the guide sleeve and comes to rest on the leveling porch of the jacket leg. Thus, the guide sleeve, in combination with the leveling porch, performs

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substantially the same function as the depending support leg of the '918 invention in substantially the same way to achieve substantially the same result of a "stabbing connection." [**14] " See *Ethicon Endo-Surgery, Inc.*, 149 F.3d at 1320 ("Two physical components of an accused device may be viewed in combination to serve as an equivalent of one element of a claimed invention."). In this case, the equivalent of an "insertion" occurs when the leveling piling passes through the guide sleeve. As to the "extension", the piling has multiple sections. The last section of the piling serves as the equivalent of an extension at the end of the piling.

"Metal-to-Metal Bearing Contact"

The parties dispute the proper meaning of the "metal-to-metal bearing contact" limitation. Shell argues that the limitation requires direct physical contact or "touching" of two metal surfaces. Riles, on the other hand, contends that the limitation requires only that "there is a load transferred in compression or bearing from one metal surface to another." Riles further asserts that in the case of the Spirit platform, the four-inch layer of wood timbers on the underside of the leveling porch does not support the weight of the jacket.

At the outset, the district court did not interpret this claim term to require direct contact of metal on metal, but instead required "a weight [**15] bearing contact." This interpretation gives appropriate meaning to the word "bearing" in the claim. Moreover, in the context of the metal jacket leg (over seven hundred feet in length), a four-inch layer of wood on the leveling porch is an insubstantial addition. *Sage Prods.*, 126 F.3d at 1423. Thus, even without a direct physical "metal-to-metal contact," a reasonable jury could have found that the Spirit platform uses the equivalent of "metal-to-metal bearing contact." In other words, the record supports the jury's potential finding that the metal-to-metal bearing contacts between the leveling porches and the top of the leveling pilings transfer the compressive weight of the jacket from the jacket legs to the pilings.

The doctrine of prosecution history estoppel does not prevent Riles from employing the doctrine of equivalents on this claim element. During prosecution of the '918 patent, Riles attempted to distinguish the Graham reference with this statement: "Graham does not describe a metal-to-metal bearing contact for transferring loads to the legs of the platforms." This statement in context does not evince an unmistakable surrender of subject matter of

any [**16] claim coverage beyond direct metal on metal contact. In context, Riles' prosecution statement does not suggest a preference for metal on metal, or metal on wood, or metal on concrete weight bearing contacts. Moreover the statement does not discuss in any way the directness of the contact for the weight transfer. Rather, the focus of the statement explained the transfer of compressive load.

Graham involved a semi-submersible platform tied to a structure attached to the sea floor by tension tie rods. Graham did not transfer compressive load to the anchored structure. Riles did no more than explain that his invention does transfer load onto the anchored structure. Thus, Riles's prosecution statements do not evince any surrender of claimed subject matter, let alone an unmistakable surrender. The district court correctly found that the record supported the jury's finding [*1311] that Shell's process met the "metal-to-metal bearing contact" limitation under the doctrine of equivalents.

"Depending Support Leg"

Because Shell's installation of the Spirit platform met the "depending support leg" limitation literally, this court need not reach the issue whether the installation met the limitation [**17] under the doctrine of equivalents.

C.

Upon a finding of infringement, Title 35 permits an award of "damages adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer." 35 U.S.C. § 284 (1994). In *Aro Manufacturing*, the Supreme Court stated that the statutory measure of "damages" is "the difference between [the patent owner's] pecuniary condition after the infringement, and what his condition would have been if the infringement had not occurred." *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 377 U.S. 476, 507, 141 U.S.P.Q. (BNA) 681, 694, 12 L. Ed. 2d 457, 84 S. Ct. 1526 (1964). This formulation requires the patentee to reconstruct the market, by definition a hypothetical enterprise, to project economic results that did not occur. "To prevent the hypothetical from lapsing into pure speculation, this court requires sound economic proof of the nature of the market and likely outcomes with infringement factored out of the economic picture." *Grain Processing Corp. v. American Maize-Products Co.*, 185 F.3d 1341, 1350, 51 U.S.P.Q.2D (BNA) 1556,

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1562 (*Fed. Cir.* 1999). [**18] The statute guarantees patentees a reasonable royalty even when they are unable to prove entitlement to lost profits or an established royalty rate. A "reasonable royalty" contemplates a hypothetical negotiation between the patentee and the infringer at a time before the infringement began. *Hanson v. Alpine Valley Ski Area, Inc.*, 718 F.2d 1075, 1078, 219 U.S.P.Q. (BNA) 679, 682 (*Fed. Cir.* 1983). Again, this analysis necessarily involves some approximation of the market as it would have hypothetically developed absent infringement. This analysis, in turn, requires sound economic and factual predicates. See, e.g., *Crystal Semiconductor*, 246 F.3d 1336; *Shockley v. Arcan, Inc.*, 248 F.3d 1349, 58 U.S.P.Q.2D (BNA) 1692 (*Fed. Cir.* 2001).

Shell challenges the amount of the jury's damage award. The record shows that the jury could have relied on any of three economic models set forth by Riles's damage expert, Mr. Dry. Thus, this court examines each of these models for adequate evidence to support the verdict. If only one of the models supports the jury's award, this court must affirm.

Mr. Dry's first model was based upon a percentage (2-5%) of the cost [**19] of Shell's platform. His theory was Shell's construction of the platform with a patented method could result in an injunction on use of the platform. If such an injunction were in place, according to Mr. Dry, Shell would have had to choose between abandoning its \$ 84 million platform or paying Riles a percentage. Mr. Dry's assumptions, however, are legally incorrect.

Mr. Dry's first incorrect assumption is that an injunction on use of the patented '918 method could enjoin use of the entire \$ 84 million platform. This court has stressed that a trial court, upon a finding of infringement, must narrowly tailor an injunction to fit the specific adjudged violations. *Gemveto Jewelry Co. v. Jeff Cooper Inc.*, 800 F.2d 256, 259, 230 U.S.P.Q. (BNA) 876, 878 (*Fed. Cir.* 1986). Thus, an injunction cannot impose unnecessary restraints on lawful activity. *Id.* Shell may lawfully use its platform without infringing [**1312] a patent on a method of anchoring the jacket during erection. Without more serious allegations than this record contains, infringement of the '918 patent could not support an injunction on all lawful use of the Spirit platform. Thus Mr. Dry's theory that Riles deserves a royalty [**20] based on the cost of the entire platform

rests on a predicate that this record does not support.

For another reason, this model cannot support the jury verdict. As noted above, Title 35 entitles Riles to the pecuniary benefit lost due to the infringement, measured either in terms of lost profits or in terms of a reasonable royalty. Under either theory of patent damages, the market would pay Riles only for his product - a method of anchoring offshore oil rigs without mud mats. Mr. Dry's model does not associate his proposed royalty with the value of the patented method at all, but with the unrelated cost of the entire Spirit platform, which includes much more than the cost of anchoring without mud mats. Stated otherwise, in the hypothetical negotiation that characterizes the reasonable royalty calculation, Shell may have had non-infringing alternatives to installing with temporary pilings. Thus, under the constraints of the hypothetical negotiation, the market could not award Riles a royalty for his method divorced of all relation to a potential non-infringing alternative method. The economic relationship between the patented method and non-infringing alternative methods, of necessity, [**21] would limit the hypothetical negotiation. See *Grain Processing*, 185 F.3d at 1347 (the difference in production costs between infringing and non-infringing products "effectively capped the reasonable royalty award"). On the other hand, the cost of the entire Spirit platform would have little, if any, relevance in the hypothetical negotiation. Mr. Dry's model does not account for the actual losses due to infringement of the patented method. Accordingly, for this reason as well, this first model could not support the jury's verdict.

Mr. Dry's second model posited that Riles deserved a percentage (2-5%) of the gross revenue received from the first year of production on the Spirit platform. Again, Mr. Dry's theory rested on an assumption that Riles could enjoin Shell from using the platform. Faced with dismantling the platform, Mr. Dry opined, Shell would pay Riles a percentage of its income from the operation of the platform. As noted above, however, this record does not show a circumstance in which Riles could enjoin Shell's lawful use of its platform based on infringement of the '918 patent.

This court can imagine a circumstance where the trial court might appropriate [**22] a portion of Shell's revenue to satisfy a judgment based on correct damages theories - namely the revenue Riles would have received

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from the market for his patented method. Once again, as discussed above, the entire revenue of the Spirit platform bears no relation to the value of the patented method. Therefore, for the same reasons that model one could not sustain the jury verdict, Mr. Dry's model two also fails.

Mr. Dry's third model was simply to add the first two models together. Mr. Dry, however, did not provide any basis for combining the two models (cost of platform and revenue for the first year). This model only compounds the errors of analysis in the first two models. This court cannot discern any reasonable economic or factual basis for this third model either.

Compensatory damages, by definition, make the patentee whole, as opposed to punishing the infringer. *Aro Mfg.*, 377 U.S. at 507 ("The question to be asked is 'Had the infringer not infringed, what would the patent holder [*1313] . . . have made?'"). The record simply does not support a jury verdict of \$ 8.7 million, which approximates 4.5% of Mr. Dry's third model. At no time did Riles present evidence that [**23] this royalty rate reflected an agreement between Shell and Riles in a hypothetical negotiation. *Rite-Hite*, 56 F.3d at 1554 (citing *Hanson*, 718 F.2d at 1078). A reasonable royalty determination for purposes of making a damages evaluation must relate to the time infringement occurred, and not be an after-the-fact assessment. *Hanson*, 718 F.2d at 1079 ("The key element in setting a reasonable royalty . . . is the necessity for return to the date when the infringement began.") (quoting *Panduit Corp. v. Stahl Bros. Fibre Works, Inc.*, 575 F.2d 1152, 1158, 197 U.S.P.Q. (BNA) 726, 731 (6th Cir. 1978)). Clearly, Mr. Dry's models did not reflect what royalty rate a hypothetical negotiation between Shell and Riles would have yielded at the time the infringement began. Instead, the models reflected Mr. Dry's assessment of the worth of Shell's oil rig at the time of the trial. Riles did not provide any evidence or testimony to show that Mr. Dry's models reflected what the parties might have agreed to, at any time, particularly at the time the infringement began. As the district court noted, the issue of infringement was a close question.

[**24] Furthermore, Mr. Dry's models ignored Riles's established licensing practice. *Unisplay, S.A. v. American Elec. Sign Co.*, 69 F.3d 512, 519, 36 U.S.P.Q.2D (BNA) 1540, 1545 (Fed. Cir. 1995) (The patentee's prior license agreements "should carry considerable weight in calculating a reasonable royalty

rate."); *Studiengesellschaft Kohle, m.b. H. v. Dart Indus., Inc.*, 862 F.2d 1564, 1568, 9 U.S.P.Q.2D (BNA) 1273, 1278 (Fed. Cir. 1988) ("The patentee's usual licensing approach should be considered in assessing a reasonable royalty."). The record suggests that Riles's past licenses based the royalty rate on a percentage of any savings that the licensee would realize from use of the patent or upon a fee based on platform depth, and not on a percentage of the cost of the platform or the revenue for first year or both. Indeed, Riles had earlier approached Shell on licensing his '918 patent for Shell's Enchilada project. In sum, Mr. Dry's models did not follow proper reasonable royalty criteria. Thus, the district court abused its discretion in overruling Shell's objections to Mr. Dry's models.

Without a model to support the jury's verdict, this court must remand to grant the trial [**25] court the opportunity to carry out the mandate of the statute. The statute promises the patentee, as a minimum, a reasonable royalty as compensation for infringement. The record, however, does not supply any basis for this court to arrive at a reasonable royalty.

Shell also urges that a reasonable royalty may not exceed the cost savings between its proposed non-infringing alternative - installation with mud mats - and the patented method. *Grain Processing*, 185 F.3d at 1347 (finding American Maize's production cost difference between infringing and noninfringing product "effectively capped the reasonable royalty award"). Shell claims that "mudmats were an available alternative and that Shell saved \$ 350,000 by not using them." In fact, the record shows that Shell considered installation with mud mats during planning of installation of the Spirit platform. Riles, on the other hand, argues that mud mats were not an available alternative in the installation of the Spirit platform due to "a difficult sea floor and very soft and unstable soil conditions." In this regard, this court finds the evidence of record conflicting. Upon remand, the district court is free to entertain [**26] additional evidence by the parties on this fact issue in its re-determination of the damage award. The trial court may also consider any other evidence about non-infringing alternatives.

[*1314] D.

The jury found Shell's infringement willful. Nonetheless, the district court denied enhanced damages. A finding of willfulness does not mandate enhanced

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damages. *Cybor Corp.*, 138 F.3d at 1461. Rather, "the paramount determination [for enhanced damages] . . . is the egregiousness of the defendant's conduct based on all the facts and circumstances." *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 826, 23 U.S.P.Q.2D (BNA) 1426, 1435 (Fed. Cir. 1992).

Despite record evidence that Shell copied the '918 patent, the district court found that the issues of infringement, damages, and willfulness were close questions. It further noted that the case was hard-fought, and that the jury could have found for Shell on the infringement and willfulness issues and could have awarded substantially less damages. In addition, the trial court weighed Shell's litigation behavior and found no reason for an award of enhanced damages. Hence, after balancing all of the factors, the court concluded that [**27] Riles should not recover enhanced damages. The district court did not abuse its discretion in denying Riles enhanced damages.

III.

Substantial evidence supports the jury's finding of Shell's infringement of Riles's '918 patent. Accordingly, this court affirms that portion of the district court judgment. This court also affirms the denial of enhanced damages. This court, however, vacates and remands the case to the district court for a re-determination of the damage award.

COSTS

Each party shall bear its own costs.

AFFIRMED-IN-PART, VACATED-IN-PART, and REMANDED.

DISSENT BY: MICHEL

DISSENT

MICHEL, Circuit Judge, dissenting.

I respectfully dissent from the majority's affirmation of the denial of JMOL on equivalent infringement. In my view, we should hold that, under the All Elements Rule, use of the defendant's structure cannot infringe by equivalents the method claims of *U.S. Patent No. 4,669,918* ("the '918 patent") because neither a judge nor a reasonable jury could conclude that the accused method used a device containing a "metal-to-metal bearing

contact" or a "stabbing connection" between an angled "depending support leg" and a piling. I would thus overturn the jury's verdict [**28] of infringement and enter judgment for the accused infringer.

Turning to the first of three disputed limitations -- "metal to metal weight bearing contact" -- the trial court's undisputed and, I conclude, correct construction of this limitation is "a weight bearing contact between two metal surfaces." Accordingly, the limitation requires that the (lower) end of one metal tube (the jacket support leg) be in direct contact with the (top) end of another (the piling). See, e.g., Webster's II New Riverside University Dictionary 303 (1984) (defining "contact" as "the touching of two objects or surfaces"). The patentee does not dispute that the defendant's structure, unlike that used in the claimed invention, lacks such metal-to-metal contact. Shown below, the defendant's structure has a piece of wood and a metal "porch" separating one metal tube from the other metal tube, i.e., the accused method's metal jacket support leg and the metal piling never come into direct contact.¹

1 True, as the majority indicates, the "weight bearing" limitation is met, because the weight from the jacket leg is transferred to the piling via the porch and wood timbers. However, the "metal to metal" requirement of the limitation must still be satisfied, and it is not.

[**29] [*1315] [SEE ILLUSTRATION IN ORIGINAL]

It stands to reason, then, that the claimed "metal-to-metal" contact is missing altogether from the defendant's structure, meaning equivalent infringement as a matter of law simply cannot occur. See, e.g., *Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 29-30, 137 L. Ed. 2d 146, 117 S. Ct. 1040 (1997) ("The doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole, [and] it is important to ensure that the application of the doctrine, even as to an individual element, is not allowed such broad play as to effectively eliminate that element in its entirety."); *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 934-35, 4 U.S.P.Q.2D (BNA) 1737, 1739 (Fed. Cir. 1987) (en banc) ("Under the doctrine of equivalents, infringement may be found (but not necessarily) if an accused device performs substantially the same overall function or work, in substantially the same way, to obtain substantially the

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same overall result as the claimed invention. That formulation, however, does not mean one can ignore claim limitations." (citations omitted)). The [**30] trial court should have granted JMOL on this basis alone.

A similar analysis applies to the angled "depending support legs" limitation. The trial court's uncontested -- and correct -- construction defined this limitation as "the lower portion of a space frame jacket leg which is angled to permit a stabbing connection to be made with a piling for support of the platform system." (Emphases added.) Separately, the trial court construed the limitation "stabbing connection" to mean "an end-to-end joining of two metal tubes by the insertion of an extension attached to the end of one of the tubes into the end of the other." (Emphasis added.) The claim limitation "depending [*1316] support legs," however, incorporates such a "stabbing connection" and thus was construed to require, in toto, "the lower portion of a space frame jacket leg which is angled to permit 'an end-to-end joining of two metal tubes by the insertion of an extension attached to the end of one of the tubes into the end of the other.'" Of course, one of the tubes is a vertical piling for support of the platform system and the other is the now-vertical jacket leg at its lower extremity. Such a configuration is shown [**31] in the rendition of the structure of the patented method reproduced immediately below.

[SEE ILLUSTRATION IN ORIGINAL]

But this limitation's angled depending support leg feature is missing from Shell's device. Shell's jacket leg does not rest on or touch the top of the piling and is not angled at its lower extremity to become vertical. As shown in the figure below, it does have an attached piece angled down and to the left that ends at the "leveling porch." As is unmistakable from the evidence, Shell's piling extends from the ocean floor upward and its top surface is then embedded in the wood timbers at the underside of the leveling porch. The jacket leg, however, is not angled to become vertical, and the leg and the vertical piling do not join at all, much less by the "insertion of an extension attached to the end of one of" these tubes. Indeed, they cannot, because the lower leg portion is not angled such that it could be inserted inside the piling, or vice versa. Compare col. 9, ll. 28-35 of the '918 patent with the rendition of the structure disclosed by the patent reproduced above.

Again, therefore, the limitation's angled depending jacket support leg stabbingly connected [**32] to the

piling is also altogether missing from the structure used in the accused method. See, e.g., *Warner-Jenkinson*, 520 U.S. at 39 n.8 ("If a theory of equivalents would entirely vitiate a particular claim element, partial or complete judgment should be rendered by the court . . ."); *Pennwalt Corp.*, [*1317] 833 F.2d at 935, 4 U.S.P.Q.2D (BNA) at 1739 ("[A] court may not, under the guise of applying the doctrine of equivalents, erase a plethora of meaningful structural and functional limitations of the claim on which the public is entitled to rely in avoiding infringement." (citations omitted)).

In short, because all three disputed limitations recite structures that are utterly and unmistakably missing from the defendant's structure, the patentee is legally barred from benefiting from the doctrine of equivalents. I would therefore reverse and enter judgment for Shell. See *Weisgram v. Marley Co.*, 528 U.S. 440, 455-56, 145 L. Ed. 2d 958, 120 S. Ct. 1011 (2000) (holding that appellate court can enter judgment for party when it determines that substantial evidence did not support jury verdict). All other issues although decided correctly, I [**33] agree, by the majority, would thereby become moot.

The All Elements Rule is applied by courts as a legal matter. See, e.g., *Bell Atlantic Network Servs., Inc. v. Covad Comm. Group, Inc.*, 262 F.3d 1258, 1267, 59 U.S.P.Q.2D (BNA) 1865, 1869-70 (Fed. Cir. 2001) (stating that the All Elements Rule and prosecution history estoppel are legal limitations upon the doctrine of equivalents). And no amount of assertion by any trial witness can trump this rule to create a triable fact issue. Accordingly, no court need ask whether such evidence can be considered "substantial" because that standard of appellate review applies only to factual, not legal, issues. For this reason, the verdict cannot be sustained. Indeed, the issue of equivalent infringement of the three disputed limitations should never have been given to the jury in the first place. See *id.* at 1279-80, 59 U.S.P.Q.2D (BNA) at 1879 ("Thus, if a court determines that a finding of infringement under the doctrine of equivalents would entirely vitiate a particular claim element, then the court should rule that there is no infringement under the doctrine of equivalents." (citations omitted) (emphasis added)). The doctrine [**34] of equivalents was simply inapplicable to these limitations as a matter of law because a court must recognize that the features recited in these three limitations as correctly construed (without disagreement) were altogether missing from the

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defendant's device.



3 of 6 DOCUMENTS

DataQuill Limited vs. Handspring, Inc.

01 C 4635

**UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF
ILLINOIS**

2003 U.S. Dist. LEXIS 27659

**December 19, 2003, Decided
December 19, 2003, Filed**

SUBSEQUENT HISTORY: Motions ruled upon by
DataQuill Ltd. v. Handspring, Inc., 2004 U.S. Dist.
LEXIS 8289 (N.D. Ill., May 7, 2004)

PRIOR HISTORY: *Dataquill Ltd. v. Handspring, Inc.*,
2003 U.S. Dist. LEXIS 2981 (N.D. Ill., Feb. 28, 2003)

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JUDGES: Charles P. Kocoras, Magistrate Judge.

OPINION BY: Charles P. Kocoras

OPINION

Plaintiff's Motion [*2] to Exclude Expert Statement
of Defendant's Expert Witness Dr. Allais

ORDER

Plaintiff Dataquill, Ltd. has moved to exclude the
report of Dr. David Allais, one of Handspring's experts in
this case. They base their motion of *Fed. R. Civ. Proc.*
37(c)(1), which provides the appropriate measures to be
taken when a party does not comply with its discovery
obligations.

In response to Dataquill's allegations of patent
infringement, Handspring has asserted a defense that
Dataquill's patent is invalid on grounds of obviousness.
Dataquill propounded interrogatories inquiring into the
specifics of Handspring's contentions. Handspring

responded to the interrogatories and periodically supplemented their initial responses. Discovery closed in April 2002, and in November 2003, Handspring tendered Dr. Allais's expert report. Several of the prior art references included in the report were not among those identified in Handspring's interrogatory responses.

We do not agree with Dataquill's contention that Handspring's expert is bound solely to the contentions put forth in their interrogatory responses. However, even if he were, the failure to include them before this point is harmless. The time for expert [*3] discovery has not passed; Dataquill still has a full opportunity to inquire into Dr. Allais's contentions and the bases for his opinions at his deposition. See *Transclean Corp. v. Bridgewood Servs., Inc.*, 77 F. Supp. 2d 1045, 1063-64 (D. Minn. 1999). This is not a case such as that faced by the court in *Abbott Laboratories v. Syntron Bioresearch, Inc.*, in which a party filed several prior art references after the expert had been deposed and the time allotted for expert discovery had elapsed, foreclosing their opposition from exploring the applicability of the new prior art. 2001 WL 34082555, at *2 (S.D. Cal. Aug. 24,

2001); see also *ADC Telecommunications, Inc. v. Thomas & Betts Corp.*, 2001 U.S. Dist. LEXIS 17796, 2001 WL 1381098, at *4-*5 (D. Minn. Oct. 18, 2001).

Furthermore, Dataquill cannot show that it is prejudiced by the inclusion of the new prior art references. The vast majority of the references are contained in Dataquill's own patent, and the others are readily available for Dataquill to examine and analyze in preparation for Dr. Allais's deposition. Because Dataquill has shown neither harm nor prejudice resulting from the disclosure, the extreme sanction of exclusion is not warranted under *Rule 37(c)(1)* [*4] in this case. See *Finley v. Marathon Oil Co.*, 75 F.3d 1225, 1230 (7th Cir. 1996).

Dataquill's motion to exclude the report of Dr. Allais is denied in its entirety. In light of this decision, the stay of discovery with respect to Dr. Allais is lifted. The deposition of Dr. Allais must be taken on or before January 16, 2004. The pretrial order must be filed on or before February 16, 2004.